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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,573	12/13/2001	G. William Walster	SUN-P6445-SPL	8135

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EXAMINER

ZHU, JERRY

ART UNIT	PAPER NUMBER
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2129

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/017,573	Applicant(s) WALSTER ET AL.	
	Examiner Jerry Zhu	Art Unit 2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. §101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

the invention as disclosed in claims 1-21 is directed to non-statutory subject matter.

2. Claims 1-21 are simply using a computer to solve a mathematic problem. If the mathematic problem can be solved manually, such as using pencil and paper, without a computer, then the claims are not limited to practice in the technological arts. Examiner finds that computation using either a cashier's register type of calculator or a super computer to accommodate for the quantitative change in data, or storing the computation results either in mechanistic/electronic medium or on paper does not change technical merit. It neither changes the logic of the mathematic formulation nor transfers anything outside the computing machine. On that basis alone, they are clearly nonstatutory.

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3. Regardless of whether any of the claims are in the technological arts, none of them is limited to practical applications in the technological arts. Examiner finds that *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) controls the 35 USC §101 issues on that point for reasons made clear by the Federal Circuit in *AT&T Corp. v. Excel Communications, Inc.*, 50 USPQ2d 1447 (Fed. Cir. 1999). Specifically, the Federal Circuit held that the act of:

...[T]aking several abstract ideas and manipulating them together adds nothing to the basic equation. *AT&T v. Excel* at 1453 quoting *In re Warmerdam*, 33 F.3d 1354, 1360 (Fed. Cir. 1994).

Examiner finds that Applicant's "a global optimization problem specified by a function f and a set of equality constraints" references are just such abstract ideas.

4. Examiner bases his position upon guidance provided by the Federal Circuit in *In re Warmerdam*, as interpreted by *AT&T v. Excel*. This set of precedents is within the same line of cases as the *Alappat-State Street Bank* decisions and is in complete agreement with those decisions. *Warmerdam* is consistent with *State Street's* holding that:

Today we hold that *the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price*, constitutes a practical application of a mathematical algorithm, formula, or calculation because it produces "a useful, concrete and tangible result" -- *a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.* (emphasis added) *State Street Bank* at 1601.

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5. That case later eliminated the “business method exception” in order to show that business methods were not *per se* nonstatutory, but the court clearly *did not* go so far as to make business methods *per se* statutory. A plain reading of the excerpt above shows that the Court was *very specific* in its definition of the new *practical application*. It would have been much easier for the court to say that “business methods were *per se* statutory” than it was to define the practical application in the case as “...the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price...”

6. Additionally, the court was also careful to specify that the “useful, concrete and tangible result” it found was “a final share price momentarily fixed for recording purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.” (i.e. the trading activity is the further practical use of the real world monetary data beyond the transformation in the computer - i.e., “post-processing activity”.)

7. Applicant cites no such specific results to define a useful, concrete and tangible result. Neither does Applicant specify the associated practical application with the kind of specificity the Federal Circuit used.

8. Furthermore, in the case *In re Warmerdam*, the Federal Circuit held that:

...[T]he dispositive issue for assessing compliance with Section 101 in this case is whether the claim is for a process that goes beyond simply manipulating 'abstract ideas' or 'natural phenomena' ... As the Supreme Court has made clear, '[a]n idea of itself is not patentable, ... taking several abstract ideas and manipulating them together adds nothing to the basic equation'. In re Warmerdam 31 USPQ2d at 1759 (emphasis added).

9. Since the Federal Circuit held in *Warmerdam* that this is the “dispositive issue” when it judged the usefulness, concreteness, and tangibility of the claim limitations in that case, Examiner in the present case views this holding as the dispositive issue for determining whether a claim is “useful, concrete, and tangible” in similar cases. Accordingly, the Examiner finds that Applicant manipulated an abstract function and an algorithm using a set of equality constraints to solve a purely mathematic problem in the abstract. It is not clear what *kind* of tangible and concrete problem is being solved. Nor is it evident from the disclosure what the limits are on this type of algorithm. One cannot tell if any transformation occurs outside of the computer. Clearly, a claim for manipulation of a function is abstract. Furthermore, applicant’s disclosure states that the “invention” is not limited by the disclosed embodiments at page 9, lines 7-9. Therefore, it is considered that the claims are not limited by the disclosed embodiment and the disclosed “invention” is not statutory.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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10. Claims 1-21 are rejected under 35 USC 112, first paragraph because current case law (and accordingly, the MPEP) require such a rejection if a 101 rejection is given because when Applicant has not in fact disclosed the practical application for the invention, as a matter of law there is no way Applicant could have disclosed *how* to practice the *undisclosed* practical application. This is how the MPEP puts it:

("The how to use prong of section 112 incorporates as a matter of law the requirement of 35 U.S.C. 101 that the specification disclose as a matter of fact a practical utility for the invention.... If the application fails as a matter of fact to satisfy 35 U.S.C. § 101, then the application also fails as a matter of law to enable one of ordinary skill in the art to use the invention under 35 U.S.C. § 112."; In re Kirk, 376 F.2d 936, 942, 153 USPQ 48, 53 (CCPA 1967) ("Necessarily, compliance with § 112 requires a description of how to use presently useful inventions, **otherwise an applicant would anomalously be required to teach how to use a useless invention.**"). See, MPEP 2107.01(IV), quoting In re Kirk (emphasis added).

Therefore, claims 1-21 are rejected on this basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Eldon Hansen's "Global Optimization Using Interval Analysis" (Hansen).

Claim 1

12. Hansen discloses a method for using computer system (page 3, paragraph 7-9; page 4, paragraphs 1-4) to solve global optimization problem (chapter 12) specified by a function f (page 179, paragraph 1) and a set of equality constraints (page 179, paragraph 1). The method comprising:

Receiving a representation of functions and a set of constraints (page 3, para7-9) (it is inherent that a computer system if used for mathematic computation, will receive inputs)

Storing the representation in a memory (page 3, para7-9) (also inherent that computer will store the inputs and results in memory)

Performing an interval global optimization process to compute guaranteed bounds on a globally minimum value of the function $f(x)$ subject to the set of equality constraints. (page 186, section 12.8. the steps of the algorithm)

Wherein the optimization process involves, applying term consistency to the set of equality constraints over subbox X , and excluding portions of subbox X that can be shown to violate any of the equality constraints. (page 186, section 12.8. the steps of the algorithm)

Claims 2

13. In the global optimization process, Hansen further discloses preconditioning the set of equality constraints through multiplication by an approximate inverse matrix B to

produce a set of preconditioned equality constraints; applying term consistency to the set of preconditioned equality constraints over the subbox X; and excluding portions of the subbox X that can be shown to violate any of the preconditioned equality constraints. (page 186, section 12.8. the steps of the algorithm)

Claims 3-7

14. Claims 3-7 are detail steps of performing an interval global optimization process and these steps are anticipated by Hansen. (page 186, section 12.8. the steps of the algorithm)

Claims 8-14

15. Claims 8-14 correspond to claims 1-7. The method claims 1-7 are implemented in a computer (page 3, paragraph 7-9; page 4, paragraphs 1-4) as disclosed in claims 8-14. Using a computer to perform mathematic computation does not add any new or change technical rational to what is described in claims 1-7. Therefore the rejections of claims 8-14 are under the same terms as the rejection of claims 1-7.

Claim 15-21

16. Claims 15-21 correspond to claims 1-7 and therefore are rejected under the same rationale as cited in the rejection of rejected claims 1-7.

Response to Arguments

Applicants remarks filed on February 22, 2005 have been reviewed by Examiner but are found to be unpersuasive. The unpersuasive arguments made by Applicant are stated below:

Patentability of Claims 1-21 Under 35 U.S.C. 101 and 112

Applicant has following arguments after amending independent claims:

1. Improving computational efficiency
2. Its usefulness is in computational intensive tasks such as predicting weather, optimizing design of an aircraft engine.
3. Special-purpose hardware

For the third argument, applicant does not explain the nature of computation that cannot be performed by a general computer(s) and special-purpose *hardware is necessary* (i.e. One can design a special-purpose hardware to add two numbers which is not necessary.) For the first argument, improving computational efficiency, as it explains itself, is purely mathematical. Solving mathematical equations is *abstract* regardless the speed of solving it and *regardless of using hardware or not*. For the second argument, it contains patentable matter for usefulness. But they (i.e. weather and aircraft) are not *limited to the claims*.

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Since the claims stand or fall on their own *obviously* do not disclose any statutory material on their own, (even Applicant himself saw fit to look the *Specification* rather than the *claims* for statutory material) it is obvious that the claim limitations do not limit the claimed invention to statutory material and the rejections made by Examiner under 35 U.S.C. 101 in the non-final rejection were proper.

Conclusion

This Action Is Made Final. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final.

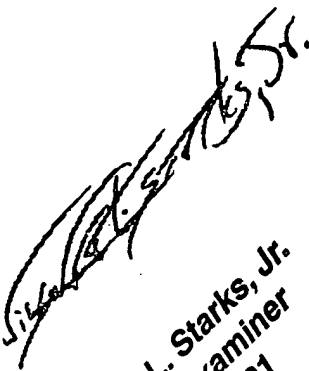
Any inquiry concerning this communication or earlier communications from the Examiner should be directed to the examiner's supervisor, Anthony Knight whose telephone number is (571) 272-3687.

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Jerry Zhu
Examiner
Art Unit - 2129
Tuesday, May 03, 2005


Wilbert L. Starks, Jr.
Primary Examiner
Art Unit - 2121